

GPS Based Detection and Located the Accident and Transfer the Information to Ambulance /Hospital/ Police Station Using Gsm Technology

N.Balaji , S. Harish Raja , S.Kaleeshwaran ,S.Sugumar

Abstract— The Rapid growth of technology and infrastructure has made our lives easier. Now a days the vehicle purchase and vehicle user level is widely increase in the world. The road accidents take place frequently which causes huge loss of life and property Road accidents are mainly increased the human death rate [6]. Poor emergency system and accident detection system is the main cause for increasing the death rate in this situation our project gives excellent emergency system to reduce the human death rate the loss of human life due to accident is to be avoided. Generally, the development of satellite communication technology is easy to identify the vehicle locations. Vehicle tracking systems have brought this technology to the day-to-day life of the common person. We can detect the accident using GPS, GSM technology

Our project is to reduce the response time of emergency services, and they get the information immediately Currently GPS vehicle tracking ensures their safety as travelling If any accident may occurs the protection system is sends the SMS to the nearby ambulance or nearby hospitals or nearby police station. To accidental vehicle tracking and locating systems are using mainly give a first aid to the patients to save the life

Keywords: GSM, GPS, Vibration Sensor, AT 89S52, Temperature sensor

I. INTRODUCTION

In present situation if any accident is occurs means there is no fast recovery system .Fast recovery system is must be required. In our project GSM and GPS based vehicle location and tracking system will provide effective, real time vehicle location, mapping and reporting this information value and ads by improving the level of service provided. A GPS-based vehicle tracking system will inform where your vehicle is and where it has been, how long it has been. The system uses geographic position and time information from the Global Positioning Satellites. The system has an "On-Board Module" which resides in the vehicle to be tracked and a "Base Station" that monitors data from the various vehicles. The On-Board module consists of GPS receiver, a GSM modem.

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Today GPS used in cars, ambulances, fleets and police vehicles are common sights on the roads of developed countries. All the existing technology support tracking the vehicle place and status The GPS/GSM Based System is one of the most both GSM and GPS technologies. GPS is detect the accident location and send the alert message to the nearby ambulance or nearby hospitals or nearby police station which is helpful for the fast recovery for vehicle users.

II. DESCRIPTION OF COMPONENTS

1. Power Supply
2. AT89S52 Microcontroller
3. GPS
4. Vibration Sensor
5. Temperature sensor
6. GSM

A. Power Supply

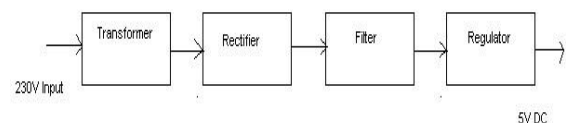


Fig 1 – Block diagram

The above figure shows the power supply section. It consists of step down transformer, rectifier, filter and regulator.

B. AT89S52 Micro Controller

The Microcontroller works at a crystal frequency of 11.0592 MHz the crystal is connected across pins 18 and 19 [7].This frequency is used to set the serial port communication at 9600 bps. The proximity sensor and the IR receiver are connected to ports p2.1 (22) and p2.0 (21). The ports p3.0 and p3.1 are used for serial port communication. The port p1.2 is connected to the voice processor. Send Serial switch is connected to the p1.1 (2) ports which when pressed the data from the DS1307 is sent to the PC. The Learn_ Software switch when pressed predicts the obstacles by learning from the history of obstacles and their event timings. The RESET pin (9) is used for resetting the microcontroller. EA/VPP - External Access Enable. EA must be strapped to GND in order to enable the device to fetch code from external program memory locations starting at 0000H up to FFFFH. When the

AT89S52 is executing code from external program EA should be strapped to VCC for internal program executions. This pin also receives the 12-volt programming enable voltage (VPP) during Flash programming.

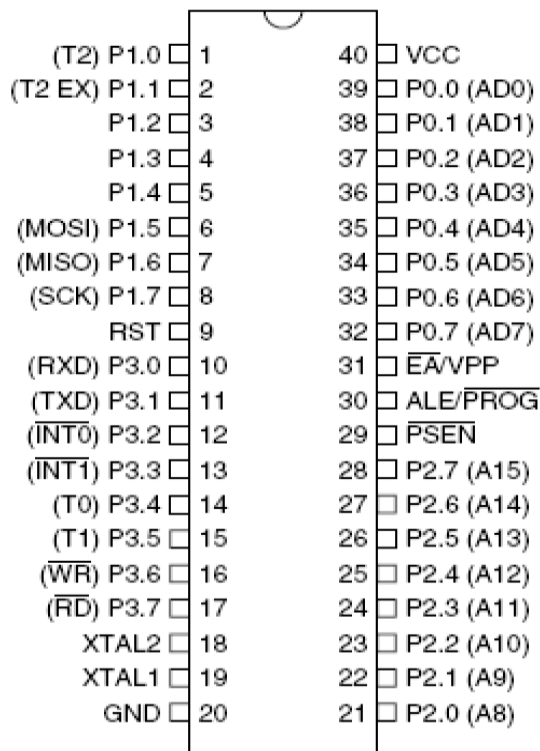


Fig 2 Pin diagram of microcontroller

C. Features

We chose this Microcontroller because it is cheap and it follows textbook standards and hence is very useful for learning purposes. The various other features which have been benefiting are:

- Compatible with MCS-51® Products
- 8K Bytes of In-System Programmable (ISP) Flash Memory Endurance: 1000 Write/Erase Cycles
- 4.0V to 5.5V Operating Range
- Fully Static Operation: 0 Hz to 33 MHz
- Three-level Program Memory Lock
- 256 x 8-bit Internal RAM
- 32 Programmable I/O Lines
- Three 16-bit Timer/Counters
- Eight Interrupt Sources
- Full Duplex UART Serial Channel
- Low-power Idle and Power-down Modes
- Interrupt Recovery from Power-down Mode
- Watchdog Timer
- Dual Data Pointer
- Power-off Flag

D. GPS



A GPS receiver calculates its position by precisely timing the signals sent by GPS satellites high above the Earth. Each satellite continually transmits messages that include the time the message was transmitted precise orbital information (the ephemeris) the general system health and rough orbits of all GPS satellites (the almanac).

The receiver utilizes the messages it receives to determine the transit time of each message and computes the distances to each satellite. These distances along with the satellites' locations are used with the possible aid of trilateration, depending on which algorithm is used, to compute the position of the receiver. This position is then displayed, perhaps with a moving map display or latitude and longitude; elevation information may be included. Many GPS units show derived information such as direction and speed, calculated from position changes.

Three satellites might seem enough to solve for position, since space has three dimensions and a position near the Earth's surface can be assumed. However, even a very small clock error multiplied by the very large speed of light — the speed at which satellite signals propagate — results in a large positional error. Therefore receivers use four or more satellites to solve for the receiver's location and time. The very accurately computed time is effectively hidden by most GPS applications, which use only the location. A few specialized GPS applications do however use the time; these include time transfer, traffic signal timing, and synchronization of cell phone basestations.

Although four satellites are required for normal operation, fewer apply in special cases. If one variable is already known, a receiver can determine its position using only three satellites. (For example, a ship or plane may have known elevation.) Some GPS receivers may use additional clues or assumptions (such as reusing the last known altitude, deadreckoning, inertial navigation, or including information from the vehicle computer) to give a less accurate (degraded) position when fewer than four satellites are visible.

E. VIBRAION SENSOR

VIB04 is an our general vibration transducer module, This module holds high sensitivity to catch vibration signal and output high or low voltage signal level to wake up a microcontroller or can be counted to estimate the amount and duration of vibration, it works stable and reliable, big regulating range. It's ideal for the vehicles theft-proof system

and kinds of domestic security system. Meanwhile, PCBA adopts SMT technical craft, imported components and assembled, and two kinds of output voltage signal were chosen.

That the vibration sensor are (6 sensors) are fixed around the vehicle parts. That to be detect he highest value of 433.9MHz.

1) Function description:

Work voltage : 12VDC
Operating current : <10mA
Stand by current
(When at rest) : <0.3mA
Output mode : high/low voltage signal level can choose any one of two kinds)
Sensitivity : Adjustable
Size : 50*35*20mm (LWH)
connection sign : red-12v (anode), black-GND (cathode), blue--signal output

2) Application field:

All kinds of vibration triggered wake-up in vehicle & domestic security system etc.

F. TEMPRATURE SENSOR

The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature [8]. The LM35 thus has an advantage over linear temperature sensors calibrated in ° Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling. The LM35 does not require any external calibration or trimming to provide typical accuracies of $\pm 1/4^{\circ}\text{C}$ at room temperature and $\pm 3/4^{\circ}\text{C}$ over a full -55 to $+150^{\circ}\text{C}$ temperature range. Low cost is assured by trimming and calibration at the wafer level.

The LM35's low output impedance, linear output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. It can be used with single power supplies, or with plus and minus supplies. As it draws only $60\ \mu\text{A}$ from its supply, it has very low self-heating, less than 0.1°C in still air. The LM35 is rated to operate over a -55° to $+150^{\circ}\text{C}$ temperature range, while the LM35C is rated for a -40° to $+110^{\circ}\text{C}$ range (-10° with improved accuracy). The LM35 series is available packaged in hermetic TO-46 transistor packages, while the LM35C, LM35CA, and LM35D are also available in the plastic TO-92 transistor package. The LM35D is also available in an 8-lead surface mount small outline package and a plastic TO-220 package.

In the temperature sensors are measure he temperature value, I may fixed nearby the vehicle engine. That may measure the value of 120°c - 160°c .

G. Features

- Calibrated directly in ° Celsius (Centigrade)
- Linear + 10.0 mV/°C scale factor

- 0.5°C accuracy guarantee able (at $+25^{\circ}\text{C}$)
- Rated for full -55° to $+150^{\circ}\text{C}$ range □Suitable for remote applications
- Low cost due to wafer-level trimming
- Operates from 4 to 30 volts □Less than $60\ \mu\text{A}$ current drain
- Low self-heating, 0.08°C in still air □Nonlinearity only $\pm 1/4^{\circ}\text{C}$ typical
- Low impedance output, 0.1 W for 1 mA load

H. GSM

GSM (Global System for Mobile Communications) originally from (*Group Spécial Mobile*) is the most popular standard for mobile telephony systems in the world. The GSM Association, its promoting industry trade organization of mobile phone carriers and manufacturers, estimates that 80% of the global mobile market uses the standard. GSM is used by over 1.5 billion people across more than 212 countries and territories. Its ubiquity enables international roaming arrangements between mobile network operators, providing subscribers the use of their phones in many parts of the world. GSM differs from its predecessor technologies in that both signaling and speech channels are digital, and thus GSM is considered a *second generation*(2G) mobile phone system. This also facilitates the widespread implementation of data communication applications into the system.

The ubiquity of implementation of the GSM (Global System Market) standard has been an advantage to both consumers, who may benefit from the ability to roam and switch carriers without replacing phones, and also to network operators, who can choose equipment from many GSM equipment vendors.^[4]GSM also pioneered low-cost implementation of the short message service (SMS), also called text messaging, which has since been supported on other mobile phone standards as well. The standard includes a worldwide emergency telephone number feature.

Newer versions of the standard were backward-compatible with the original GSM system. For example, Release '97 of the standard added packet data capabilities by means of General Packet Radio Service (GPRS). Release '99 introduced higher speed data transmission using Enhanced Data Rates for GSM Evolution (EDGE).

I. Technical details

GSM is a cellular network, which means that mobile phones connect to it by searching for cells in the immediate vicinity. There are five different cell sizes in a GSM network—macro,micro,pico,femtoand umbrella cells. The coverage area of each cell varies according to the implementation environment.



GSM cell site antennas in the Detaches Museum, Munich, Germany

Macro cells can be regarded as cells where the base station antenna is installed on a mast or a building above average roof top level. Micro cells are cells whose antenna height is under average roof top level; they are typically used in urban areas. Picocells are small cells whose coverage diameter is a few dozen metres; they are mainly used indoors. Femtocells are cells designed for use in residential or small business environments and connect to the service provider's network via a broadband internet connection. Umbrella cells are used to cover shadowed regions of smaller cells and fill in gaps in coverage between those cells.

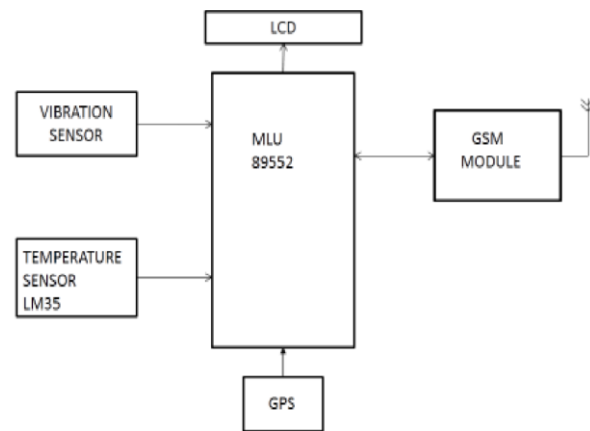
III. PROPOSED HARDWARE SYSTEM

If any accident is occurs means temperature and vibration sensor is detect the accident. Vibration sensor is sense the abnormal vibration in the vehicles during accident timings. Also the temperature sensor also detect the abnormal temperature of the vehicles. The vibration set level is in the range of 433.9MHZ. The temperature set range is 120 ° C to 160° C .If the temperature or vibration is increase is in the rated value anyone sensor can detect the accident and send the alert message to the micro controller.

GPS is find the accident location, time and date. It is useful for find the location and distance of the vehicle. Micro controller is interfaced with the GSM modem. The accident alert message is send from the using of GSM modem.

If any accident may occurs the protection system is sends the SMS to the nearby ambulance or nearby hospitals or nearby police station.

BLOCK DIAGRAM



IV. CONCLUSION AND FUTURE SCOPE

Vehicle tracking system is becoming increasingly important in large cities and it is more secured than other systems. Now a day's vehicle the fitting is rapidly increasing, with this we can have a good control in it. The vehicle can be turned off by only with a simple SMS [6]. Since, now a days the cost of the vehicles are increasing they will not step back to offer it. This setup can be made more interactive by adding a display to show some basic information about the vehicle and also add emergency numbers which can be used in case of emergency. Upgrading this setup is very easy which makes it open to future requirements without the need of rebuilding of everything from scratch, which also makes it more efficient.

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